

Remarks

Claims 1-4, 8-61, and 66-68 are pending in the application, with claims 1, 9, 16, 26, 35, 45, 46, 48, 50, 52, 53, 54, 56, 58, 60, and 61 being the independent claims. The allowance of claims 16-34, 45-47, 52-55, and 60-61 and the indication of allowability of claims 2, 15, 37-44, 49, 51, 57 and 59 is noted with appreciation.

Claims 1, 3-4, 8-14, 35-36, 48, 50, 56, 58 and 66-68 were rejected as obvious based on the combination of a newly cited article by Dr. Naofumi Takagi *et al.* and Fox *et al.* (U.S. Patent 5,276,633). This rejection is respectfully traversed, and reconsideration is requested based on the following remarks.

The claimed invention relates to angle rotators. The Takagi article describes a sine and cosine computation method, not an angle rotator. Similarly, Fox does not relate to angle rotators. The output of the Fox circuit is a single high-precision sine value (363) and a single high-precision cosine value (364). Moreover, the Fox circuit does not produce both coarse and fine sets of sine/cosine values that could be incorporated into a digital circuit such as the circuits employed in the claimed invention. As can be seen upon further review, the combination of two references that do not involve angle rotation cannot produce the claimed invention.

The Office Action also suggests that it would be obvious to add a memory device of the type shown in Fox *et al.* to the circuit disclosed in Takagi *et al.* However, these two circuits are incompatible at a basic level, and the suggested modification of the Takagi reference would not produce the claimed invention.

All of the assertions in the Office Action regarding the disclosure of Takagi are inaccurate and are particularly traversed. The Office Action suggests that the

Takagi reference discloses "an angle rotator for rotating an input complex number." This assertion is incorrect, since the Takagi system always starts its calculation at a *fixed point* in the X - Y plane. There is no "input complex number" in Takagi. The only input is the angle value θ . The cited portions do not disclose, nor does the reference produce, a rotated complex number according to an input angle θ wherein θ_M is a coarse approximation to input angle θ . The disclosed CORDIC process stores small angle values $\arctan 2^{-j}$, for $j = 1, \dots, n$ that have no particular relationship to any specific angle θ that might appear as a CORDIC input.

To make out a *prima facie* case of obviousness, the combination must provide each and every feature of the claimed invention and there must be some clear motivation to make the combination set forth in the references relied upon for the rejection. However, there is no teaching in either of the references used in the rejection that discloses or suggests using $\sin \theta_M$ and $\cos \theta_M$ values as inputs to an angle rotation circuit as recited in each of the rejected claims.


The rejections applied to the dependent claims are similarly traversed. Each of the dependent claims 3, 4, 8, 10-14, 36 and 66-68 is believed to be independently patentable, as well as being patentable for the reasons given above with regard to the features of the independent claims.

Applicants respectfully request that the Examiner reconsider the pending rejection. Applicants believe that the application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Reply is respectfully requested.

Respectfully submitted,

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